

Work Order ID 85316

June-05-12 3:36:46 PM

85316

Page 1

Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 19/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: MLJ

Date: 12/06/05 Tooling:

Date:

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr								
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D407-667-245	Rev F/DEO								
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100									
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100	DOCUMENT CONTROL								
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DC	Memo	0.00	DAS	16	9-69	2(4/2)	008		
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Document Control	Photocopy bluefile and create labels as per PPP D407-667-205 CHG001								
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110	Pick Kit	0.00							
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110	Packaging	0.00							
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Packaging	Memo	0.00							
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--	--	--	--	--	--	--	--	--	--

120	Pick Kit	0.00							
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120	BENDING MACHINE - CROSSTUBES	0.00							
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CNC Bend 1	Memo	0.00							
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CNC.Delta 100 Bender	1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21								
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SP

0.00

DAS
16
9-69
2(4/2)
008

for MLJ 12-7-17

DP
12-7-17

DP
12-7-17

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering Quality <input type="checkbox"/>			
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>				
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>				
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>				
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Offset/Setup										
Other										
Process										
Supplier										
Training										
Unauthorized										
FAULT CATEGORY										
Landing Gear				Hardware		General				
Bending Passes Below Min				<input type="checkbox"/> Breaking	<input type="checkbox"/> Burrs	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Set-up			
Centre Not Concentric to O/S				<input type="checkbox"/> Missing	<input type="checkbox"/> Contamination	<input type="checkbox"/> Mislabeled	<input type="checkbox"/> Supplier			
Cracks				<input type="checkbox"/> Size/Length	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Off-Set	<input type="checkbox"/> Temperature/Cure			
Crushed/Crimp at Bending				<input type="checkbox"/> Spinning	<input type="checkbox"/> Documentation/Data	<input type="checkbox"/> Orientation Misread	<input type="checkbox"/> Weld			
Inspection Strip in Tube				<input type="checkbox"/> Threading	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Calibration	<input type="checkbox"/> Wrong Stock Pulled			
Other				<input type="checkbox"/> Wrong	<input type="checkbox"/> Inspection Incomplete	<input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Other			
Positioned Wrong				Drill Holes		<input type="checkbox"/> Outside Dimensions				
Ripples on Inner Bend				<input type="checkbox"/> Misaligned	<input type="checkbox"/> Inspection Unqualified	<input type="checkbox"/> Over/Under tolerance				
Torque Waves in Extrusion				<input type="checkbox"/> Ovalized	<input type="checkbox"/> Instructions Incomplete/Unclear	<input type="checkbox"/> Part Lost				
Turning Sequence				<input type="checkbox"/> Over/Undersized	<input type="checkbox"/> Jigs/Fixtures/Tooling	<input type="checkbox"/> Part Moved				
Wave/Twist in Tube				<input type="checkbox"/> Too Many	<input type="checkbox"/> Kit Incorrect	<input type="checkbox"/> Raw Material				
					<input type="checkbox"/> Kit Missing					

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Page 2

Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Stop

NS2

Start Date: 05/06/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 19/06/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run

Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

130

QC

Quality Control

Memo

0.00

DAS
16
S-SS
17/4/12

NCR: Yes / No

DOA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION <input type="checkbox"/> Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update		AGAINST DEPARTMENT/PROCESS <input type="checkbox"/> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> Prod. Eng. Coor. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> Other <input type="checkbox"/> Engineering <input type="checkbox"/> Quality					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance		Initial Chief Eng	Action Description		Sign & Date	Verification	QC Inspector
Doc/Data											
Equip/Tooling											
Operator											
Material											
Offset/Setup											
Other											
Process											
Supplier											
Training											
Unauthorized											
FAULT CATEGORY											
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing		<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material			
								<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled			
								<input type="checkbox"/> Other			

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Page 3

Item ID: D407-667-205

Accept

N900040100

Setup Start *NS1*

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 19/06/2012 Req'd Qty: 1.00 *1*

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/
Work Center ID

140

140

Crosstubes

Crosstubes

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Crosstubes

Memo

0.00

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245 Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245 Note: Aft side has 3x top holes.

7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.

8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

9- Scribe tube to identify on the inner chamfer in the cuff D# and B#

10-Deburr & Inspect for surface damage. Repair damage within limits as per

Rm 12-7-19
JW

7 MO 12-7-19

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order:	DISPOSITION				AGAINST DEPARTMENT/PROCESS				
Part No.	Rework	<input type="checkbox"/>	Skid-tube	<input type="checkbox"/>	Crosstube	<input type="checkbox"/>	Prod. Eng. Coor.	<input type="checkbox"/>	Engineering
NCR No.	Scrap	<input type="checkbox"/>	Machining	<input type="checkbox"/>	Small Fab	<input type="checkbox"/>	Rec/Store/Packaging	<input type="checkbox"/>	Quality
	Use-as-is	<input type="checkbox"/>	Thermoforming	<input type="checkbox"/>	Finishing	<input type="checkbox"/>	Supplier	<input type="checkbox"/>	
	Work Order Update	<input type="checkbox"/>	Large Fab	<input type="checkbox"/>	Composite	<input type="checkbox"/>	Other	<input type="checkbox"/>	

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other									
Process									
Supplier									
Training									
Unauthorized									

FAULT CATEGORY

Landing Gear	Hardware	General	
Bending Passes Below Min	<input type="checkbox"/> Breaking	<input type="checkbox"/> Burrs	<input type="checkbox"/> Maintenance
Centre Not Concentric to O/S	<input type="checkbox"/> Missing	<input type="checkbox"/> Contamination	<input type="checkbox"/> Set-up
Cracks	<input type="checkbox"/> Size/Length	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Supplier
Crushed/Crimp at Bending	<input type="checkbox"/> Spinning	<input type="checkbox"/> Documentation/Data	<input type="checkbox"/> Off-Set
Inspection Strip in Tube	<input type="checkbox"/> Threading	<input type="checkbox"/> Finish	<input type="checkbox"/> Orientation Misread
Other	<input type="checkbox"/> Wrong	<input type="checkbox"/> Inspection Incomplete	<input type="checkbox"/> Out of Calibration
Positioned Wrong	Drill Holes	<input type="checkbox"/> Inspection Unqualified	<input type="checkbox"/> Out of Sequence
Ripples on Inner Bend	<input type="checkbox"/> Misaligned	<input type="checkbox"/> Instructions Incomplete/Unclear	<input type="checkbox"/> Outside Dimensions
Torque Waves in Extrusion	<input type="checkbox"/> Ovalized	<input type="checkbox"/> Jigs/Fixtures/Tooling	<input type="checkbox"/> Over/Under tolerance
Turning Sequence	<input type="checkbox"/> Over/Undersized	<input type="checkbox"/> Kit Incorrect	<input type="checkbox"/> Part Lost
Wave/Twist in Tube	<input type="checkbox"/> Too Many	<input type="checkbox"/> Kit Missing	<input type="checkbox"/> Part Moved
			<input type="checkbox"/> Raw Material
			<input type="checkbox"/> Other

Work Order ID 85316

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Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Stop

NS2Start Date: 05/06/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 19/06/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
	Dwg D407-667-245								
150 *150* HandFXtube	Crosstubes Chemical Conversion Hand Finishing Crosstubes	0.00	P/O: 17504 150	sack	180	W	CL/12/10/20 ②		
	Memo	0.00	AB	12-7-20					
160 *160* QC	QC3- Inspect Part Finish Quality Control	0.00							12.07.20
	Memo	0.00							
170 *170* QC	QC5- Inspect part completeness to step on W/O Quality Control	0.00							12.07.20
	Memo	0.00							

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>			
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>			
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>				
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>				
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Offset/Setup										
Other										
Process										
Supplier										
Training										
Unauthorized										
FAULT CATEGORY										
Landing Gear				Hardware		General				
<input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		<input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing				
				Drill Holes						
				<input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many						
						<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material				
						<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled				
						<input type="checkbox"/> Other				

NCR: Yes / No

DQA: Date: .

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order ID 85316

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Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00 ***1***Required Date: 19/06/2012 Req'd Qty: 1.00 ***1***

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center ID
210Operation
Description
SprayPaintSet Up/
Run Hours
0.00

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp***210***

SprayPaint

Spray Painting

Memo

0.00

Mask underside of crosstube as shown

1-Prime inside and outside crosstube as per DEO D407-667-245 and QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME: 121334

Start Time: 8:00 > 12-07-23 0
Finish Time: 9:00

PAINT: 122381

Start Time: 6:00 > AF 12-7-24
Finish Time: 7:00

220

QC14- Inspect Spray Paint

0.00

220

QC

Quality Control

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

DAS
16
9-08

12-07-24

NCR: Yes / No

DQA: Date:

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____				DISPOSITION		AGAINST DEPARTMENT/PROCESS						
				Rework Scrap Use-as-is Work Order Update	Skid-tube Machining Thermoforming Large Fab	Crosstube Small Fab Finishing Composite	Prod. Eng. Coor. Rec/Store/Packaging Supplier Other	Engineering Quality				
Part No. _____ NCR No. _____												
Root Cause		Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data												
Equip/Tooling												
Operator												
Material												
Offset/Setup												
Other												
Process												
Supplier												
Training												
Unauthorized												
FAULT CATEGORY												
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing		<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material			<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled	
											<input type="checkbox"/> Other	

Work Order ID 85316

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Item ID: D407-667-205

Accept

N900040100

Setup

Start

NS1

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00 ***1***Required Date: 19/06/2012 Req'd Qty: 1.00 ***1***

Cust Item ID:

Customer:

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230		0.00							
230	Crosstubes								
Crosstubes	Memo	0.00							
Crosstubes	I- Install chafing shield as per DEO D407-667-245. Top holes should be facing up. A/R Proseal 890 Batch: <u>122441</u> EXP: <u>01/13</u>								
	2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe								
	3-Install support with Scotch-Weld DP460 and install clamps as per DEO Dwg D407-667-245 using installaiton jig DT9025. Torque clampsas per dwg A/R Scotch-Weld DP460 Batch: <u>121368</u> EXP: <u>13-4-13</u>								
	4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.								

240

QC5- Inspect part completeness to step on W/O 0.00

240

QC

Quality Control

1 1207.26

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS						
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>				
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>				
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>					
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data											
Equip/Tooling											
Operator											
Material											
Offset/Setup											
Other											
Process											
Supplier											
Training											
Unauthorized											
FAULT CATEGORY											
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong Drill Holes <input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing		<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material		<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other	

Work Order ID 85316

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Item ID: D407-667-205

Accept

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00 ***1***Required Date: 19/06/2012 Req'd Qty: 1.00 ***1***

Reference:

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	*NR1*
	QC:	Date:	SPC (Y/N):	Date:		Stop	*NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250 *250* Packaging	Pick Kit Memo	0.00							12/7/2012
260 *260* QC	QC4- 100% Inspect kits for completeness Memo	0.00							
270 *270* Packaging	Packaging Memo Identify and in kanban rack Location: 26053 New. 6	0.00							12/7/2012

260 QC4- 100% Inspect kits for completeness

0.00
 (DAS) 16
 0.00 89 7/12/12

(@) _____

Quality Control

270 *270* Packaging	Packaging Memo Identify and in kanban rack Location: 26053 New. 6	0.00
----------------------------------	--	------

12/7/2012

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>			
			Scrap <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>			
			Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>				
			Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Other <input type="checkbox"/>				
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Offset/Setup										
Other										
Process										
Supplier										
Training										
Unauthorized										
FAULT CATEGORY										
Landing Gear				Hardware		General				
Bending Passes Below Min Centre Not Concentric to O/S Cracks Crushed/Crimp at Bending Inspection Strip in Tube Other Positioned Wrong Ripples on Inner Bend Torque Waves in Extrusion Turning Sequence Wave/Twist in Tube				Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong <input type="checkbox"/>	Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing <input type="checkbox"/>	Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material <input type="checkbox"/>	Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/>			
				Drill Holes				Other <input type="checkbox"/>		
				Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many <input type="checkbox"/>						

Work Order ID 85316

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85316

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Item ID: D407-667-205

Accept

N900040100

Setup Start

NS1

Revision ID:

Item Name: Crosstube Aft

Start Date: 05/06/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 19/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

280

QC21- Final Inspection - Work Order Release

0.00

12/17/30 JJ

280

QC

Quality Control

Memo

0.00

MF
12-07-27

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS					
			Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/>	Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> Other <input type="checkbox"/>	Engineering <input type="checkbox"/> Quality <input type="checkbox"/>			
Part No. _____										
NCR No. _____										
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector	
Doc/Data										
Equip/Tooling										
Operator										
Material										
Offset/Setup										
Other										
Process										
Supplier										
Training										
Unauthorized										
FAULT CATEGORY										
Landing Gear				Hardware		General				
<input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing	<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material	<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled		
									<input type="checkbox"/> Other	

Picklist Print

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Page 1

Work Order ID: 85316

85316
D407-667-205

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Start Date: 05/06/2012

Required Date: 19/06/2012

Start Qty: 1.00

Required Qty: 1.00

Comments:
 IPP Rev:C 05.09.02 Add holes for compatibility with Bell SkidtubesKJ/JLM
 IPP Rev:D Added Magnobond,Rubber Cushion & Clamps 07-02-19
 JLM

****CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER****
 IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified by:EC
 IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC
 IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC
 IPP Rev H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I
 10.04.07 revise route seq. in bom DD verified by:JLM IPP Rev J 11.04.26
 removed abrasion strip ecn 11-551 EC verified
 by:DD
 IPP REV:K
 11.10.03 DEO D407-667-245-F-2 DD verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205TRN		Manufactured	No			110	Each	0.0000	1	1			
D407-667-205TRN							383804		**		S40	12-07-17	
Crosstube Turning Detail													
AN960JD516	NAS1149D0563J	Purchased	No			230	Each	0.0000	18	18			
AN960.JD516									**		M119546	SL12/3/16	
Washer													
D2873-043		Manufactured	No			230	Each	40.0000	2	2			
D2873-043									**		A8	12-7-25	
Nut Plate Assembly													

Location	Loc Oty	Loc Code
LG052	40	
72644	2	
82949	38	(2)

NCR: Yes / No

DQA: Date: .

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Date:

Picklist Print

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Work Order ID: 85316

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

85316
D407-667-205

Start Date: 05/06/2012
Start Qty: 1.00
Required Date: 19/06/2012
Required Qty: 1.00

D2873-045

Manufactured No 230 Each 33.0000 2 2 **

D2873-045

Nut Plate Assembly

Al 12-7-25

Location	Loc Qty	Loc Code
LG052	33	
(82947)	33	

D2894-1

Manufactured No 230 Each 7.0000 1 1 **

D2894-1

2.750 Support

Al 12-7-25

Location	Loc Qty	Loc Code
LG052	7	
(75212)	1	
(82007)	6	

D3190-1

Manufactured No 230 Each 41.0000 2 2 **

D3190-1

Chafing Shield

Al 12-7-25

Location	Loc Qty	Loc Code
LG053	23	
(75947)	23	

Location	Loc Qty	Loc Code
LG055	18	
(72576)	18	

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____				DISPOSITION		AGAINST DEPARTMENT/PROCESS					
				Rework Scrap Use-as-is Work Order Update	Skid-tube Machining Thermoforming Large Fab	Crosstube Small Fab Finishing Composite	Prod. Eng. Coor. Rec/Store/Packaging Supplier Other	Engineering Quality			
Part No. _____											
NCR No. _____											
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data											
Equip/Tooling											
Operator											
Material											
Offset/Setup											
Other											
Process											
Supplier											
Training											
Unauthorized											
FAULT CATEGORY											
Landing Gear				Hardware		General					
Bending Passes Below Min	Breaking	Burrs	Maintenance	Set-up							
Centre Not Concentric to O/S	Missing	Contamination	Mislabeled	Supplier							
Cracks	Size/Length	Cut Too Short	Off-Set	Temperature/Cure							
Crushed/Crimp at Bending	Spinning	Documentation/Data	Orientation Misread	Weld							
Inspection Strip in Tube	Threading	Finish	Out of Calibration	Wrong Stock Pulled							
Other	Wrong	Inspection Incomplete	Out of Sequence								
Positioned Wrong		Inspection Unqualified	Outside Dimensions								
Ripples on Inner Bend		Instructions Incomplete/Unclear	Over/Under tolerance								
Torque Waves in Extrusion		Jigs/Fixtures/Tooling	Part Lost								
Turning Sequence		Kit Incorrect	Part Moved								
Wave/Twist in Tube		Kit Missing	Raw Material								

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Work Order ID: 85316

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

85316
D407-667-205

Start Date: 05/06/2012

Required Date: 19/06/2012

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured

No

230

Each

179.8095

2

2

**

D3595-063-450

RUBBER CUSHION

AS 12-7-25

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	60	
82511	60	
LG051	109.7	
80161	1.7	
84715	108	②
MAT052	10.109474	
67353	2	
68893	6	
70113	0.56	
71354	0.2	
74113	0.349474	
75597	1	

MS20601-AD4W8

Purchased

No

230

Each

144.0000

14

14

**

MS20601-AD4W8

RIVET

AS 12-7-25

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG051	33	
121017	33	
ST314	100	
121827	100	⑯
ST322	11	
121255	11	

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____		DISPOSITION		AGAINST DEPARTMENT/PROCESS					
Part No. _____		Rework <input type="checkbox"/>	Scrap <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering <input type="checkbox"/>		
NCR No: _____		Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Quality <input type="checkbox"/>		
		Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Finishing <input type="checkbox"/>	Supplier <input type="checkbox"/>	Other <input type="checkbox"/>			
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Offset/Setup									
Other									
Process									
Supplier									
Training									
Unauthorized									
FAULT CATEGORY									
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong Drill Holes <input type="checkbox"/> Misaligned <input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Undersized <input type="checkbox"/> Too Many		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing			
						<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material			
						<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other			

Picklist Print

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Work Order ID: 85316

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

85316
D407-667-205

Start Date: 05/06/2012

Required Date: 19/06/2012

Start Qty: 1.00

Required Qty: 1.00

MS21920-22

Purchased No 230 Each 48.0000 4 4

**

MS21920-22

Clamp(per MIL-DTL-8783C)

Al 12-7-25

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	1	
119545	1	
LG050	47	
116207	7	
117506	1	
118186	8	
120631	31	(4)

MS21920-25

Purchased No 230 Each 123.0000 2 2

**

MS21920-25

Clamp(per MIL-DTL-8783C)

Al 12-7-25

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG050	75	
116264	2	
117998	4	
118142	4	
119339	2	
119746	2	
120475	7	
120920	54	
LG051	48	
121583	48	(1)

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION		AGAINST DEPARTMENT/PROCESS														
				Rework <input type="checkbox"/>	Scrap <input type="checkbox"/>	Use-as-is <input type="checkbox"/>	Work Order Update <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Machining <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Finishing <input type="checkbox"/>	Composite <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Supplier <input type="checkbox"/>	Other <input type="checkbox"/>	Engineering Quality <input type="checkbox"/>
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance		Initial Chief Eng	Action Description		Sign & Date	Verification		QC Inspector								
Doc/Data																				
Equip/Tooling																				
Operator																				
Material																				
Offset/Setup																				
Other																				
Process																				
Supplier																				
Training																				
Unauthorized																				
FAULT CATEGORY																				
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing		<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material		<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled		<input type="checkbox"/> Other								

Picklist Print

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Page 5

Work Order ID: 85316**Parent Item:** D407-667-205**Parent Item Name:** Crosstube Aft

85316
D407-667-205

Start Date: 05/06/2012**Required Date:** 19/06/2012**Start Qty:** 1.00**Required Qty:** 1.00

AN5-10A

AN5-10A
Bolt

Purchased	No	250	Each	215.0000	10	10
-----------	----	-----	------	----------	----	----

**

m/12/2012

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST337	215	
118191	80	
121181	35	
121243	100	

AN5-32A

AN5-32A
Bolt

Purchased	No	250	Each	245.0000	4	4
-----------	----	-----	------	----------	---	---

**

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST339	145	
119862	50	
120423	75	7
120910	20	
ST340	100	
121541	100	

AN5-34A

AN5-34A
Bolt

Purchased	No	250	Each	64.0000	4	4
-----------	----	-----	------	---------	---	---

**

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
339	25	
121181	25	
ST339	39	
120422	39	4

NCR: Yes / No

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____		DISPOSITION		AGAINST DEPARTMENT/PROCESS								
Part No. _____		Rework	<input type="checkbox"/>	Skid-tube	<input type="checkbox"/>	Crosstube	<input type="checkbox"/>	Prod. Eng. Coor.	<input type="checkbox"/>	Engineering	<input type="checkbox"/>	
NCR No. _____		Scrap	<input type="checkbox"/>	Machining	<input type="checkbox"/>	Small Fab	<input type="checkbox"/>	Rec/Store/Packaging	<input type="checkbox"/>	Quality	<input type="checkbox"/>	
		Use-as-is	<input type="checkbox"/>	Thermoforming	<input type="checkbox"/>	Finishing	<input type="checkbox"/>	Supplier	<input type="checkbox"/>		<input type="checkbox"/>	
		Work Order Update	<input type="checkbox"/>	Large Fab	<input type="checkbox"/>	Composite	<input type="checkbox"/>	Other	<input type="checkbox"/>		<input type="checkbox"/>	
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance		Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data												
Equip/Tooling												
Operator												
Material												
Offset/Setup												
Other												
Process												
Supplier												
Training												
Unauthorized												
FAULT CATEGORY												
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing		<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material			<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other	

Picklist Print

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Work Order ID: 85316

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

MS21042LS
S *MS21042I 5*
Nut

Purchased No 250 Each 1,409.000 4 4
Start Date: 05/06/2012 Required Date: 19/06/2012
Start Qty: 1.00 Required Qty: 1.00

**

12/7/2008 L

Location	Loc Qty	Loc Code
300	500	
121652	500	
ST300	909	
108827	8	
116105	5	
116548	43	
117611	18	
119109	827	
17651	8	4

NCR: Yes / No

DQA: _____ Date: _____

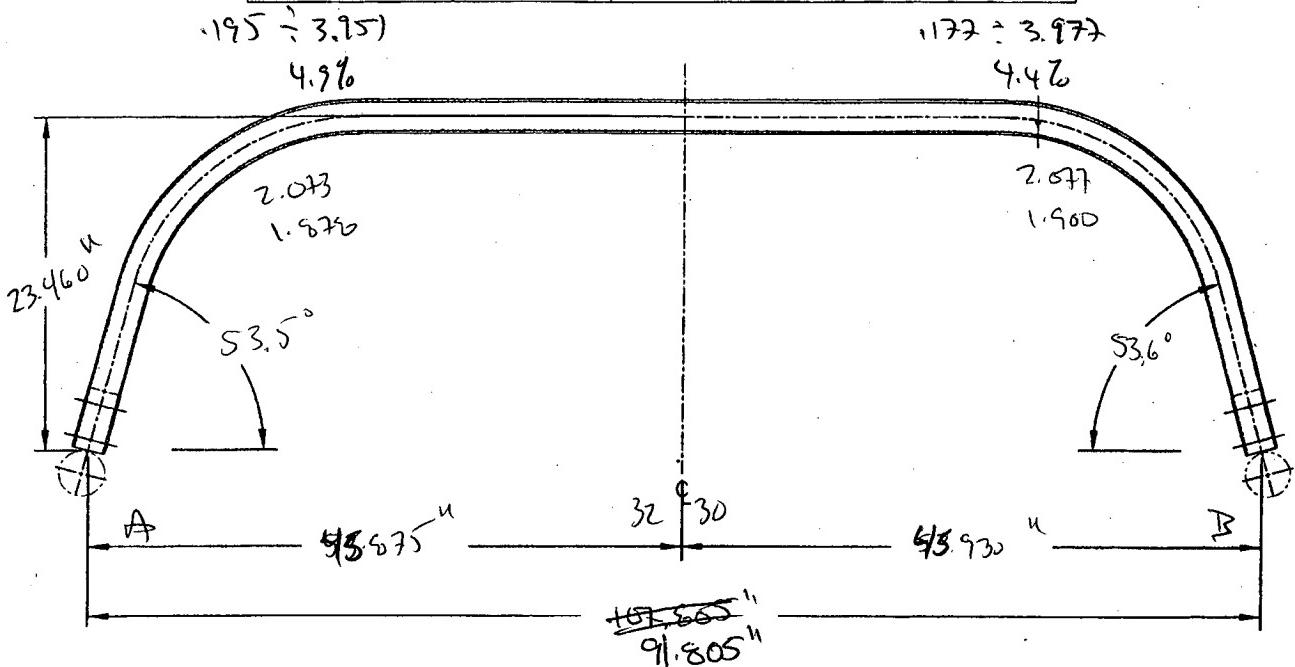
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION		AGAINST DEPARTMENT/PROCESS							
				Rework <input type="checkbox"/>	Scrap <input type="checkbox"/>	Use-as-is <input type="checkbox"/>	Work Order Update <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Engineering Quality <input type="checkbox"/>		
				Thermoforming <input type="checkbox"/>	Machining <input type="checkbox"/>	Finishing <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Supplier <input type="checkbox"/>	Other <input type="checkbox"/>		
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance		Initial Chief Eng	Action Description		Sign & Date	Verification	QC Inspector		
Doc/Data													
Equip/Tooling													
Operator													
Material													
Offset/Setup													
Other													
Process													
Supplier													
Training													
Unauthorized													
FAULT CATEGORY													
Landing Gear <input type="checkbox"/> Bending Passes Below Min <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimp at Bending <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Other <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Ripples on Inner Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				Hardware <input type="checkbox"/> Breaking <input type="checkbox"/> Missing <input type="checkbox"/> Size/Length <input type="checkbox"/> Spinning <input type="checkbox"/> Threading <input type="checkbox"/> Wrong		General <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Documentation/Data <input type="checkbox"/> Finish <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Inspection Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Jigs/Fixtures/Tooling <input type="checkbox"/> Kit Incorrect <input type="checkbox"/> Kit Missing		<input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Off-Set <input type="checkbox"/> Orientation Misread <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Lost <input type="checkbox"/> Part Moved <input type="checkbox"/> Raw Material		<input type="checkbox"/> Set-up <input type="checkbox"/> Supplier <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled			
												<input type="checkbox"/> Other	

DART AEROSPACE LTD	Work Order:	ES3/6
Description: Crosstube High Aft (407)	Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100



Comments
Size A = 4.97 ⁰ crushing Q 32 Passes
Size B = 4.47 ⁰ crushing Q 30 Passes
Acceptable 72 ⁰ 69 ⁰

QC15 Inspection	<input checked="" type="checkbox"/>
Date	7/10/16

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	RE

Item	QTY	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

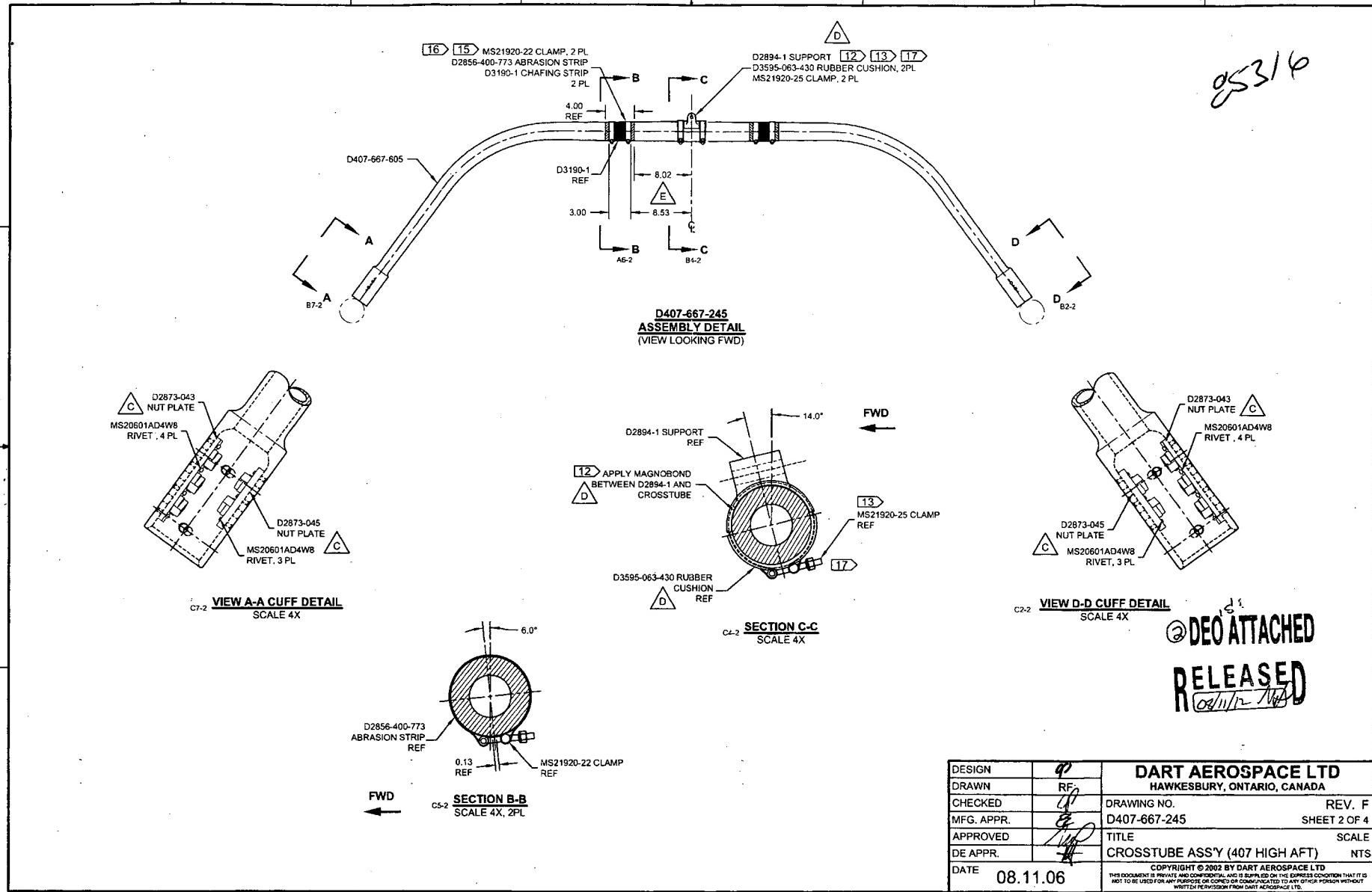
- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.05" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP DRAWING
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 05316 MLJ
12/06/05

② DEO ATTACHED

RELEASED
08/11/06

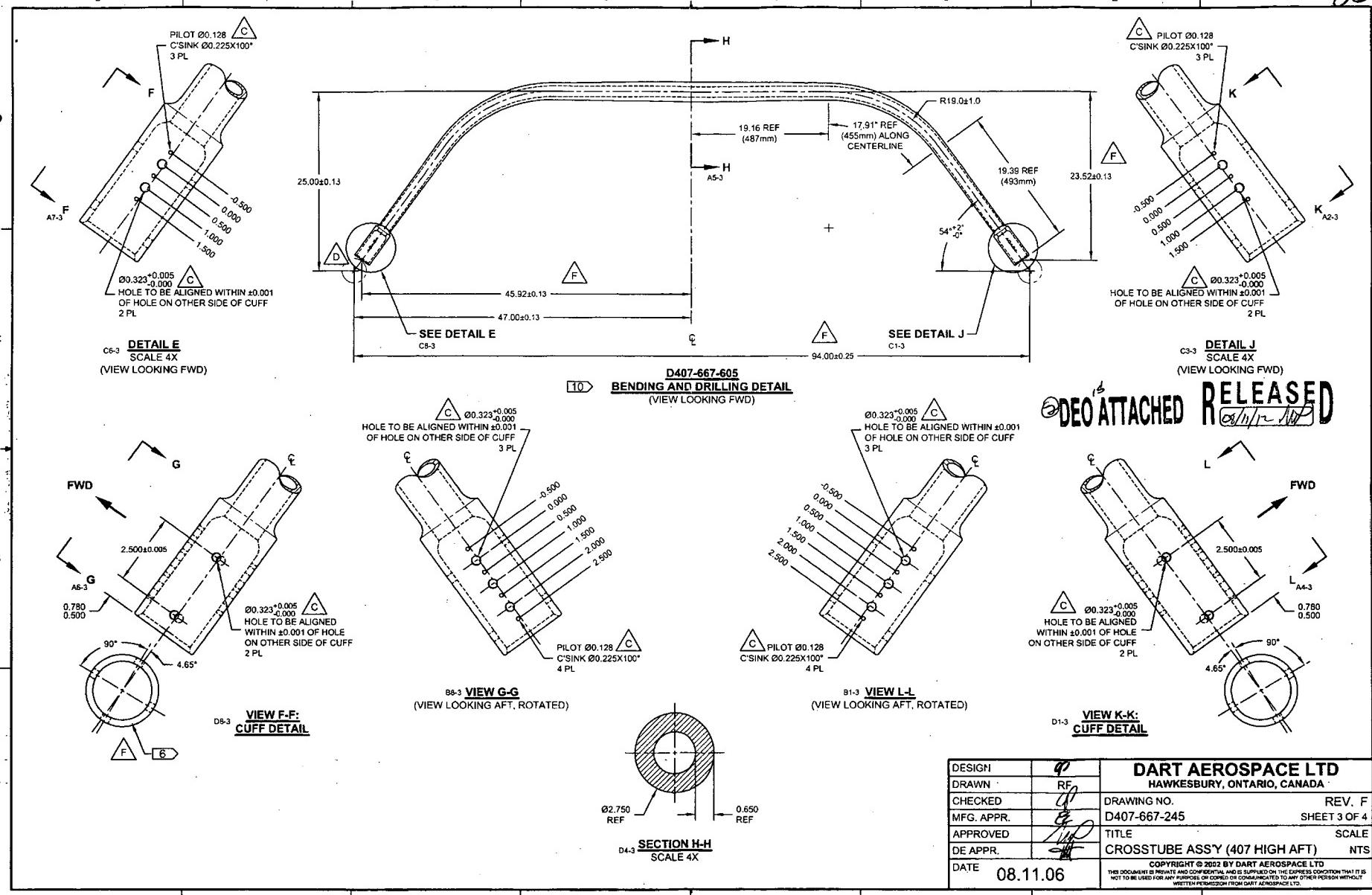
F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.80 (ZN D5-2); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BH7/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	RF	D407-667-245	SHEET 1 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE DUPLICATED OR DISCLOSED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



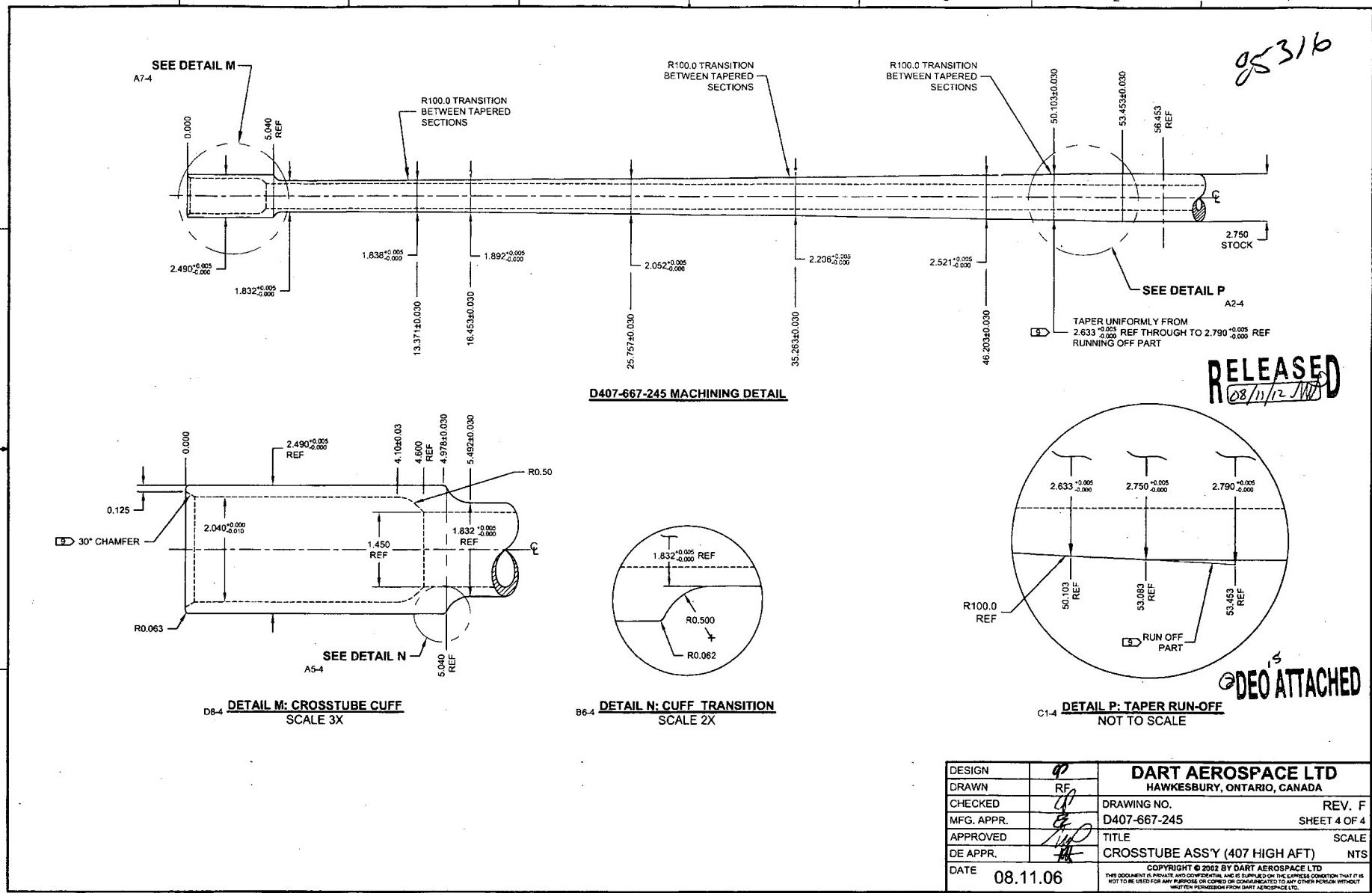
DESIGN	90	DART AEROSPACE LTD
DRAWN	RF	HAWKSLEY, ONTARIO, CANADA
CHECKED	JP	DRAWING NO.
MFG. APPR.	EJ	REV. F
APPROVED	EP	D407-667-245
DE APPR.	EP	SHEET 2 OF 4
DATE	08.11.06	TITLE
		CROSSTUBE ASS'Y (407 HIGH AFT) NTS

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② DEO ATTACHED
RELEASED
08/11/06 TWA



DESIGN	<i>9</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA		
DRAWN	RF			
CHECKED	<i>LP</i>	DRAWING NO.	REV. F	
MFG. APPR.	<i>EG</i>	D407-667-245	SHEET 3 OF 4	
APPROVED	<i>LJH</i>	TITLE	SCALE	
DE APPR.	<i>SH</i>	CROSSTUBE ASSY (407 HIGH AFT) NTS		
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PROPRIETARY AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE REPRODUCED, ANOTHER PART, OR DISCLOSED TO ANY OTHER PERSON WITHOUT THE WRITTEN CONSENT OF DART AEROSPACE LTD.		



85310

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN <i>b</i>	CHECKED <i>RP</i>	MFG. APPR. <i>B</i>	APPROVED <i>ND</i>	DE APPR. <i>H</i>		
DATE 11.04.08	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	DATE 11.04.12	

PURPOSE:

REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Item	Qty	Part Number	Description
	-245		
3	0	D2856-400-773	ABRASION STRIP

WAS:

3	2	D2856-400-773	ABRASION STRIP

NOTES 2 AND 15, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
 PAINT OUTSIDE PER DART QSI 005 4.2
 REMOVE MASKING AND APPLY CLEAR COAT
- 15) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1
 CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL
 PROSEALED D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT
 OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

WAS:

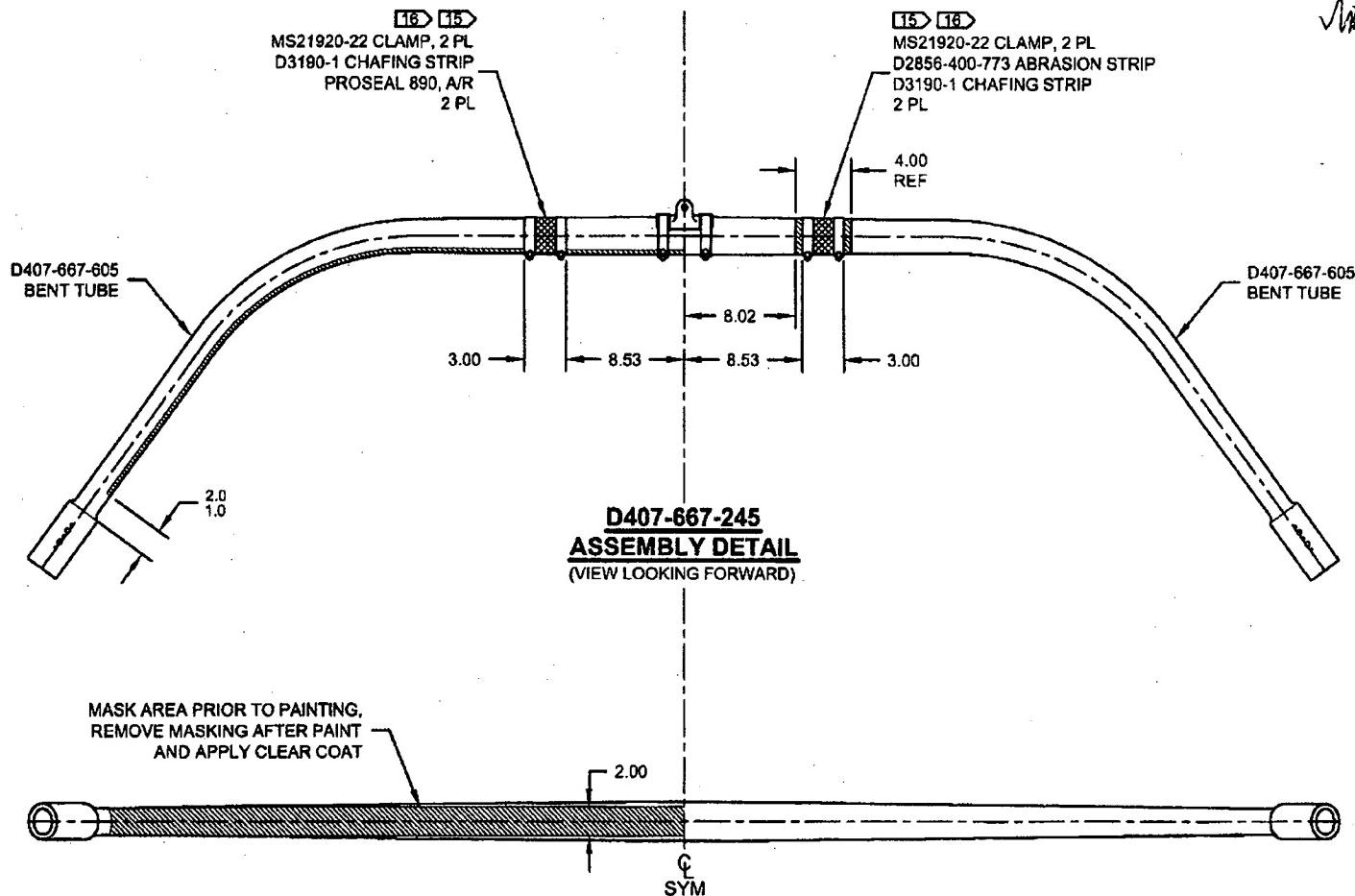
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 PAINT OUTSIDE PER DART QSI 005 4.2
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 REF GAP ON BOTTOM SIDE OF
 CROSSTUBE PER QSI 035.

RELEASED
R 2011-04-18
ND

88316

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASSY (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D407-667-245-F-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN DATE 11.04.08	CHECKED DATE 11.04.11	MFG. APPR. P	APPROVED JH	DE APPR. H			
		DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

RELEASED
2011-04-18
JW

IS:WAS:

85316

DRAWING NO. D407-667-245	TITLE CROSSTUBE ASS'Y (407 HIGH AFT)	REV. F	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D407-667-245-F-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>JP</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>E</i>	APPROVED <i>MP</i>	DE APPR. <i>MP</i>		
DATE 11.09.07	DATE 11.09.10	DATE 11.09.10	DATE 11.09.10	DATE 11.09.10	DATE 11.09.10	

PURPOSE:

REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

Item	Qty -245	Part Number	Description
12	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 17, SHEET 1 IS AMENDED AS FOLLOWS:

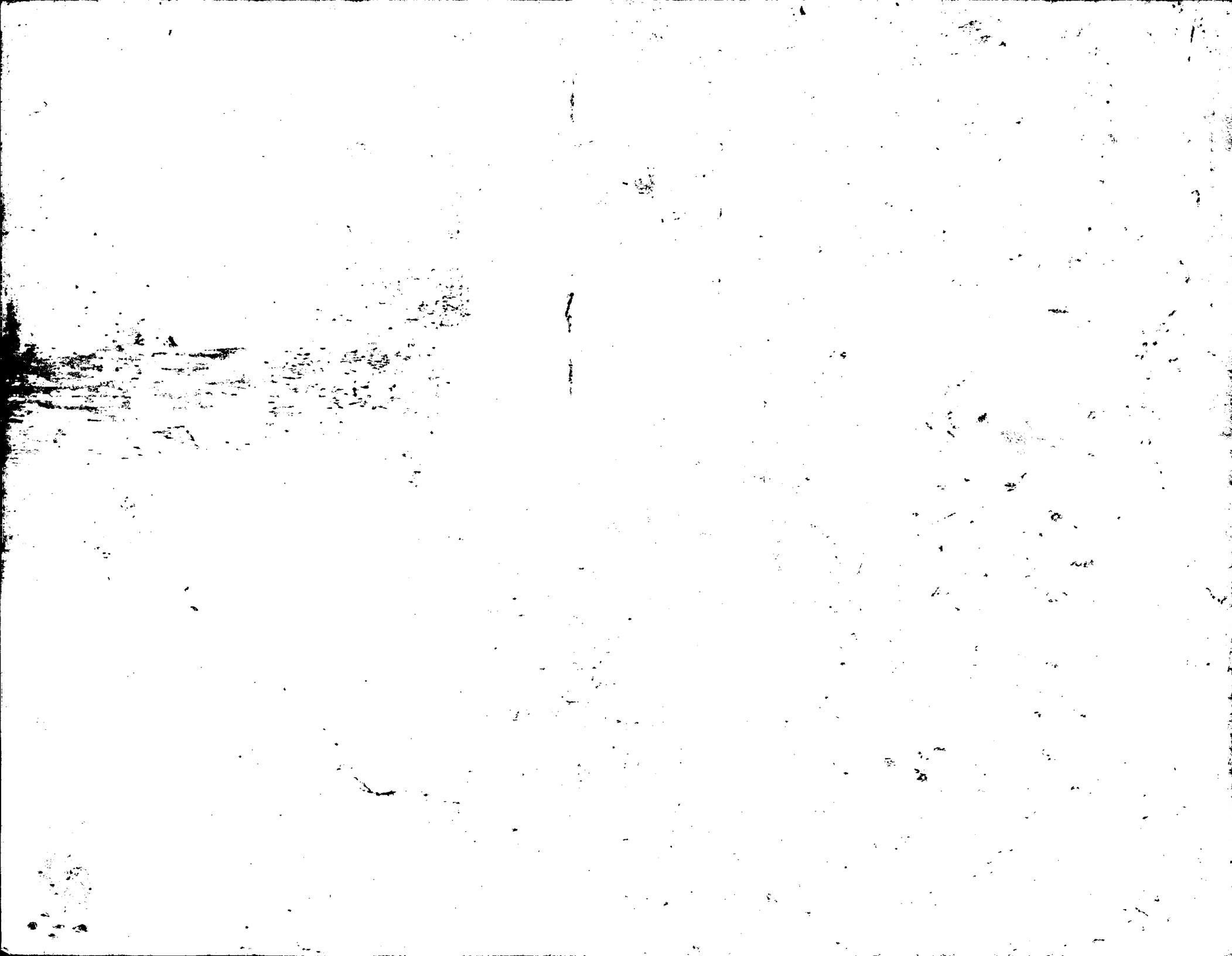
IS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.

WAS:

- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
MP 2011-09-29





LIQUID PENETRANT TEST REPORT

P- 12202

CLIENT	<u>DATE AEROSPACE</u>	DATE	<u>TUE 14 JUN 12</u>	PAGE	<u>1</u>	OF	<u>1</u>
ATTENTION	<u>ANDY / LINDA</u>	TIME	<u>188-12-00:00</u>	AM	<input type="checkbox"/>	PM	<input type="checkbox"/>
ADDRESS	<u>1270 ABERDEEN ST.</u>	ACUREN JOB NO.	<u>17504</u>				
PROJECT	<u>F.P.I. ON CROSS TUBES</u>	PO/WO NO.	<u>-</u>				
ITEM(S) EXAMINED	<u>- 11 - PCS</u>	WORK LOCATION	<u>SAME</u>				
		ACCEPTANCE STD.	<u>ASTM 1417/05I</u>	REV./DATE	<u>2005</u>		

JOB DESCRIPTION PROCEDURE NO. LT002 REV./DATE 2008 TECHNIQUE NO. LT-~~1417~~ REV./DATE 2008

PART NO. SEE REQS LTS MATERIAL Aluminum — THICKNESS VARIOUS
SCOPE A WET FLUORESCENT LIQUID PENETRANT EXAMINATION
WAS COMPLETED ON THE EXTERNAL SURFACE 100%

TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	<u>NAFLUX</u>		BLACK LIGHT S/N <u>16459</u>	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²	<input type="checkbox"/> AMBIENT < 2 fc
PENETRANT	<u>2607</u>	MINIMUM Dwell TIME <u>45 10</u> MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE		
PENETRANT REMOVER	<u>H2O</u>	MINIMUM DRY TIME <u>>10</u> MIN.	OTHER <u>LAB NO</u>		
DEVELOPER	<u>SKD 52</u>	MINIMUM Dwell TIME <u>10</u> MIN.	LIGHT METER S/N <u>1038866</u>	CAL DUE DATE <u>JUL 17, 2012</u>	
DEVELOPER TYPE	<input type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F <input type="checkbox"/> > 52°C/125°F		

RESULTS- METRIC IMPERIAL

CROSS BEVEL C.		
"	85877	✓
"	86693	✓
"	86692	✓
"	84764	✓
"	86932	✓
"	87329	✓
"	87328	✓
"	85319	✓
"	85316	✓
"	85317	✓
"	85318	✓

→ ENGINEER'S REQUEST - NCR
WAS ORIGINALLY NOTED ON JULY 12/2012
Report P- 10159.
JUL 12/2012

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE	<u>Andy Sheldon</u>	PRINT	<u>Sheldon</u>	SIGNATURE	DTR #	<u>E117389</u>
TECHNICIAN (SIGNATURE):	<u>MKE Sheldon</u>			REPORT		
NAME (PRINT):				REVIEWED BY:	NAME	INITIALS
CGSB LEVEL	<u>#</u>	SNT LEVEL	<u> </u>	2 ND TECHNICIAN		
CGSB REG. NO.	<u>6606</u>	CGSB LEVEL	<u> </u>	SNT LEVEL		
CGSB REG. NO.				CGSB REG. NO.		

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

Change Record

Part Number D407-667-205
Description 407 AFT CROSS TUBE

Page 1 of 1